

body temperature regulation

body gets cold



person starts to shiver



body warms up

body gets hot

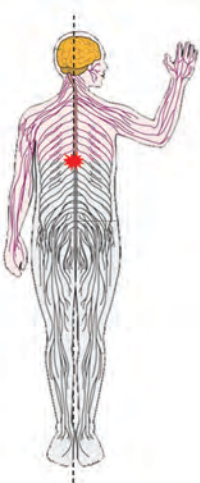


person starts to sweat



body cools down

people with spinal cord injuries



cannot shiver and cannot sweat anywhere below the lesion of the spinal cord.

If someone with paraplegia becomes hot, they will stay hot.

Likewise, if they become cold, they will stay cold.

Acknowledgements

Instructors & Mentors

| | |
|---------------------|---------------|
| Prof. David Wallace | Ilan Moyer |
| Matt Duplessie | Melody Kuna |
| Warren Seering | Josh Ramos |
| Jane Kokernak | Dick Fenner |
| Eric Statz | Bill Cormier |
| Eliza Eddison | Joe Cronin |
| Jordan Nollman | Jim Dudley |
| Shaohui Foong | Steve Haberek |

Doctors & Users

| | |
|--------------------|------------------|
| Dr. John Handrakis | Emily Obert |
| Diana Elledge | Colleen Rock |
| Jim Cesario | SCI Forum |
| Dr. Jain | Spaulding Center |

Life Savers

| | |
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| Barbara Hughey | Alexandre Milouchev |
| Danielle Morimoto | Michael Glombicki |
| Cathy Wu | Sareena Avadhany |
| Tyler Thompson | Gail Cormier |

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ThermAssist

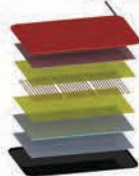


personal heating & cooling for people with paraplegia





heating



The ThermAssist heating system uses a resistive wire network to generate heat. Unlike other heating pads, the ThermAssist pad has been specially designed for people with spinal cord injuries. The pad uses thermal fuses to prevent the temperature from rising above 40C. This is just one of several safety measures in ThermAssist, bringing comfort and peace of mind to its users.



controls



ThermAssist is used with an Android application. This Android app has an additional feature of allowing the user to program his or her own "threshold temperature" to be measured by included ambient sensors. While preset, a user can select the temperatures at which they start to feel uncomfortable, allowing the system to maximize their comfort level.



safety



ThermAssist comes with several sensors on each pad to continuously monitor the pad temperatures. These together with thermal fuses ensure that the heating system stays within a safe temperature range. In addition, there is a manual override switch to automatically shut off power.



cooling



The ThermAssist cooling system consists of two modules—a cooling pad and a heat exchanger. The heat exchanger contains an organic oil that changes phases from solid to liquid when its temperature reaches 15C. While the oil is solid, it cools the water in the reservoir as it flows past. This cooled water then flows out of the heat exchanger and into the cooling pad.



power



The ThermAssist power pack contains four LiFePo4 battery cells to supply power for ~6 hours of continuous use or ~12 hours of repeated cycle use. The battery charges in ~3 hours and has a lifespan of ~5 years. The power pack also houses all of ThermAssist's circuitry.